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**Patent Abstracts of Japan**

PUBLICATION NUMBER : 59126931  
 PUBLICATION DATE : 21-07-84

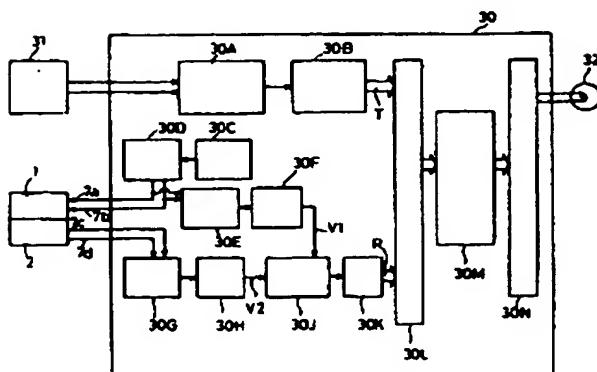
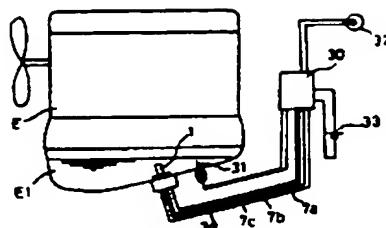
APPLICATION DATE : 12-01-83  
 APPLICATION NUMBER : 58003238

APPLICANT : NIPPON SOKEN INC;

INVENTOR : TOMITA MASAHIRO;

INT.CL. : G01N 11/16 G01N 9/00

TITLE : MEASURING DEVICE OF  
 CHARACTERISTIC OF FLUID



**ABSTRACT :** PURPOSE: To attain a fluid characteristic measuring device which is compact and has a long life, by providing a displacement measuring piezoelectric body, which measures the displacement of a piezoelectric oscillator immersed into a fluid, together with the piezoelectric oscillator as one body.

CONSTITUTION: A piezoelectric oscillator 1 is set in the bottom part of an oil pan E<sub>1</sub> of an engine E and is immersed into oil. A function generator 30C not only gives an excitation signal to the oscillator 1 through an amplifier 30D but also inputs a DC signal V<sub>1</sub> proportional to the amplitude to an operator 30J through a differential amplifier 30E and a rectifying and smoothing circuit 30F. Meanwhile, the output voltage, which is proportional to the oscillation amplitude of the oscillator 1, of a displacement measuring piezoelectric body 2 which is vibrated together with the oscillator 1 as one body is converted to a DC signal V<sub>2</sub> through a differential amplifier 30G and a rectifying and smoothing circuit 30H and is inputted to the operator 30J. The operator 30J attains a ratio of V<sub>1</sub> to V<sub>2</sub>, and this ratio is outputted to a main operating circuit 30M through an AD converter 30K to detect the deterioration of oil together with the output signal from a temperature sensor 31; and if the viscosity of oil exceeds a limit viscosity, a warning indicator lamp 32 is lit.

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